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2442.5	4495	5850	7440
2500	4500	5855	7450
2600	4510	5875	7487.5
2720	4525	6000	7500
2935	4600	6021	7506
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3030	4742.5	6106	7706.66
3053	4750	6125	7740.000
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3175	4780	6173.333	7777.777
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3255	4816	6225	7890
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3280	4870	6240	7930
3305	4875	6350	8007
3320	4955	6406	8009
3432.5	5000	6410	8010
3450	5020	6440	8012
3460	5095	6450	8014
3467	5166	6473.33	8015
3515	5180	6497	8075
3522	5205	6506	8171
3532.5	5205	6522	8175
3560	5385	6540	8220
3630	5435	6550	8290
3840	5450	6583	8392
3885	5530	6625	8400
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ously on 3570 Kc., 7140 Kc., and 1460
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Kc.

VK3WI: Sundays, 1030 hours EST, simultane-
ously on 3570 and 7140 Kc., 51.056 and
146.25 Mc. Intrastate hook-ups taken on
7135 Kc. Individual frequency checks
of Amateur Stations given when VK3WI
is on the air.

VK4WI: Sundays, 0900 hours EST, simultane-
ously on 7140 Kc., 14.343 Mc. and 50.172
Mc. Intrastate hook-ups taken on 7105
Kc.

VK6WI: Sundays, 0900 hours CAT, on 7140
Kc. Intrastate hook-ups taken on 7135
Kc. Frequency checks given when VK-
6WI is on the air and also by VK6MD
by arrangement.

VK6WL: Sundays at 0930 hours WAST, on
7145 Kc. Intrastate hook-ups taken on
7085 Kc.

VK1WI: Sundays at 1000 hours EST, on 7146
Kc. and 3072 Kc. Intrastate hook-ups
taken on 7115 Kc.

VK6WI: Sundays, 0830 hours EST, simultane-
ously on 3550, 7146 and 14343 Kc. In-
dividual frequency checks of Amateur
Stations given when VK6WI is on the air.

EDITORIAL



Television Interference and the Amateur Service

Prior to the introduction of the
Australian television service the
W.I.A. envisaged the probability of
interference to viewers by Amateur
transmitters, other frequency users
and electrical apparatus generally.
With this in mind it sought the
opportunity to submit information to
the Royal Commission on Television.

In actual fact the number of cases
of interference by Amateur trans-
missions have, until recent date, been
very few. However, over the past
few months there has been quite an
increase in t.v. interference, the
majority of cases being due to 50
Mc. transmissions and also from
v.h.f. and h.f. transmissions in fringe
areas. The problem is essentially
one of public relations—the manner
in which the Amateur approaches
the problem and the way in which
the viewer receives his efforts to
eliminate the interference.

There are two areas of interfer-
ence—(a) areas essentially serviced
by the existing television transmitters,
and (b) areas which we call
fringe areas not specifically serviced
by the existing television transmitters.
There are many forms of inter-
ference, of course, but our own
transmissions which interfere with
t.v. is our particular problem. As
far as we are concerned our trans-
mitters must be t.v. proofed, free
from harmonic radiation and gener-
ally constructed and operated in
such a manner that radiation of
other than the desired frequency
signal is not possible. That's fair
enough and is in line with the regu-

lations governing the operation of
Amateur transmitting stations.

But, unfortunately, the problem
does not end there in actual practice,
for under certain conditions
interference is occurring—particularly
around 50 Mc.—which is attrib-
utable to lack of selectivity in the
t.v. receiver "front ends" rather than
by reason of incorrect operation of
the transmitting equipment. The
problem is difficult enough in areas
essentially serviced by the trans-
mitting stations, but is greatly aggra-
vated in fringe areas where the re-
ceived t.v. signal is weak.

It is quite a problem to solve
because on the one hand the public
spend upwards of £150 in serviced
areas and upwards of £400 in fringe
areas and naturally enough consider
they have the right to obtain inter-
ference-free reception; on the other
hand the Amateur spends many
hundreds of pounds and, providing
he is satisfied that his equipment is
operating within the conditions gov-
erning his license, he rightly con-
siders he should be able to pursue
the hobby in which he has partici-
pated over the years when there was
no television service. In both cases
the Postmaster-General's Department
accepts a license fee (including
fringe areas) but in the case of the
Amateur it is £1 for some 3,800
license holders compared with £5
for thousands of t.v. viewers.

For the Amateur to adopt a "stand-
over" attitude as much as to say,
"I was here first" is fundamentally
and democratically wrong. On the

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Modifying the AR8 Receiver

G. F. JENKINSON,* VK3ZFA

THE purpose of this article is to describe some modifications to well known R.A.A.F. AR8 Aircraft Receiver which the author has carried out and which have very considerably improved the performance. The main modifications are:—

- (1) Addition of a noise limiter.
- (2) Alteration of the audio system.
- (3) Addition of a magic eye and/or S meter.
- (4) Changes of valves in the h.f. unit.
- (5) Use of a Q multiplier.

DETAILS

The first step is to disconnect the three front-panel controls which are not required for Amateur use. These are: "Traffic-DF-Sense" switch, "Sense-Resistance," and "Bearing-Reciprocal" switch. The leads for the latter two can be disconnected and put out of the way, but the leads to the rotating contact and fixed contact which is used in the traffic position must be lifted clear and joined directly together. The "Traffic-DF-Sense" switch is not used in the following modifications, but can conveniently be used as a transmit-receive switch.

The two-pin outlet below the "M/F AE Tuning" knob is disconnected, and can be used as a speaker socket.

The bakelite aerial socket is replaced by a v.h.c. coaxial socket to allow coaxial cable to be used. However, this socket is such that a normal "banana" plug can be inserted if required.

The two power cable sockets can be conveniently removed and the lower hole be used with a more convenient type of power plug. The upper hole can be used for a magic eye (see modification 3).

(1) NOISE LIMITER

This uses a 6H6 (or 6AL5) valve (see Fig. 1). This valve and most of the associated components can be mounted on a small bracket below the m.f. switch (band-change) and coils. The heater power for this valve and also the magic eye were obtained, in the author's receiver, from the supply which had originally fed the 6X5 front-end protection valve. (The heater line was left wired for 12v, and thus the 6H6 plus 6U5 magic eye drew 0.6 amp. and made up for the removal of the 6X5 which alone drew 0.6 amp.)

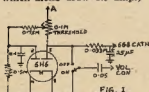


FIG. 1

The "Bearing/Reciprocal" switch was used for the noise limiter on-off switch, and the "Sense-Resistance" pot was replaced by one of 100K ohms and used for the threshold control.

*1 Were St., Brighton Beach, S.S. Vic.

It should be noted that for good noise limiter performance the cathode bypass of the 6G8 audio amplifier should be increased from its original value of 0.05 μF to 10 or 25 μF.

The connection to point A of Fig. 1 (i.e. to the bottom of the secondary of L.F.T.4 (T3)) must be made to one of the terminals at the top of this transformer, as the transformer contains some resistors and capacitor in its can, and the bottom terminals connect to point A through a resistor. An ohm-meter reading between 6G8 pin 5 and one of the "unused" terminals on the top of the last I.F., which reads 7 ohms, will give the terminal to use.

A coax cable is run from the point found above, through a hole drilled in the chassis for the purpose, to the threshold pot. on the front panel.

The shielded lead to the tag, one around clockwise from the tag connected to the plate of the last 6U7G on the last I.F. transformer, should be disconnected (open-circuited) at this point or at the other end of the shielded cable.

This noise limiter circuit is the one which is used in the AR8S receiver and seems capable of giving very good results.

(2) AUDIO MODIFICATIONS

To make up for a loss of audio gain caused by the noise limiter, the author added another audio stage after the 6G8. This was a 12SQ7, but with rearrangement of heater supplies other valves could be used, e.g. 6SQ7.

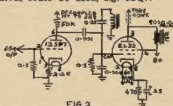


FIG. 2

The amplifier (see Fig. 2) is mounted on the socket previously occupied by the 6X5.

To drive a speaker more efficiently, the 6J7 output tube was changed to an EL32. The output transformer used for the 6J7 was removed completely. B+ and plate leads from the EL32 were run, in the author's receiver, to the loop aerial socket. (The output transformer was mounted on the speaker.)

The EL32 was chosen for the output valve because this requires only 0.2 amp. heater current, and thus the addition of a 60 ohm resistor across the heater socket connections was all that was needed to balance the heater current back to the correct value. (Circuit is given in Fig. 2.)

An audio filter was also added to the audio section (see Fig. 2). The choke used was a small speaker transformer with the paper removed from the air gap in the core and the plates interleaved. The value of capacitor is best

found experimentally. The filter in the author's receiver is a high-pass type with a low frequency cut-off of about 200 cycles. This improves the readability of weak signals.

(3) MAGIC EYE and/or S METER

A magic eye (6U5/6G5) was mounted behind the spare hole on the front panel which resulted from the removal of the original "power" and "junc. box" sockets. The 6U5/6G5, together with the 6H6 noise limiter, made up the heater current to the value originally taken by the 6X5. For circuit see Fig. 3a.



FIG. 3a

While the magic eye was useful, it was felt that an S meter would be more valuable. A simple meter measuring plate current was considered but rejected because it read backwards and only a small section of the scale could be used. However, a glance at Fig. 3b will reveal that by using about three resistors and a pot, plus the meter, the S meter is forward reading, can be zero set to any desired level, uses the full scale, and can be set to any desired sensitivity (e.g. no signal reading zero, and full scale reading at S9, or full scale at S99!!).

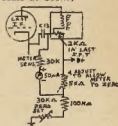


FIG. 3b

The meter used was a 50 μA. temperature gauge. However, any sensitive meter could be used with slight resistor changes. The meter was mounted away from the receiver.

The zero-set pot. was mounted at a convenient point at the back of the receiver.

(4) H.F. UNIT

It was felt that modern valves in this unit would improve the performance, and this was found to be the case.

Adaptors for plugging the miniature valves into the octal sockets were made by mounting the appropriate miniature socket on an octal plug (e.g. a discarded valve base).

Where the grid lead originally went to the valve cap, a flying lead was run from the adaptor to the appropriate tuning gang lug.

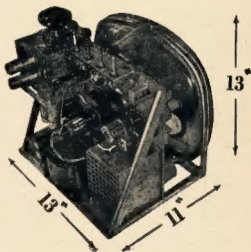
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THE GELOSO RECEIVER FRONT END UNIT

WHEN ever a new Amateur receiver hits the Australian market, it always creates a lot of interest and curiosity. In this case the interest is two fold, as R. H. Cunningham Pty. Ltd. have not only released a new receiver, the Geloso G209-R, but also in kit form the coil box, tuning condenser with dial and drive mechanism, aerial trimmer, oscillator trimmer, and a 4.8 Mc. output transformer of this receiver. This kit can form the basis of a good receiver, either as a converter fed into any receiver that tunes 4.6 Mc. or as a front-end for a home-brew I.F. strip, detector, etc., and audio.

The Publications Committee have recently had the opportunity of testing one of these kits which had been built into the converter unit described here-with. We must admit that this is one of the more pleasant duties associated with producing the magazine.

Of course the first question everyone will ask is just how well does it perform? Sensitivity figures have been published on the 209-R receiver and naturally these figures apply also to this converter. Unfortunately, figures of this kind cannot always convey just how signals sound coming through the speaker. After an extended test on ten metres (how does your receiver sound on ten?), we can definitely say that it is in the "hot" class. Conditions on the band were anything but good. However, the signals there stood out well with

The actual dial drive is one of the neatest ideas seen for a long time. The shaft from the knob is actually a 5 to 1 ratio planetary drive. This is then coupled to a 4-inch drum by means of a nylon cord. One small criticism of the tuning is the size of the knob. One about twice the diameter is needed to give the right feel.

We fed the converter into receivers ranging from a 122 set and a Type 3 to an AR88. Naturally the selectivity characteristics and gain varied from set to set, but overall performance was essentially the same with all.

To sum up, several of the committee members were heard to comment, "You can leave one in my shack any time."

Although only the component parts are available at present, a complete kit for the converter unit, including power supply, chassis, cabinet, etc., will be obtainable at a later date.

We are indebted to R. H. Cunningham Pty. Ltd. for the opportunity of testing this fine unit.

—PUBLICATIONS COMMITTEE.

★

MANY readers of "Amateur Radio" have, during the past two years, built the famous Geloso Exciter units into a transmitter and, at reasonable cost, have obtained excellent results with a "professional" finish. Now available in this country is the Geloso Receiver Front-End Unit, which is as used in the G209-R Double Conversion Superhet.

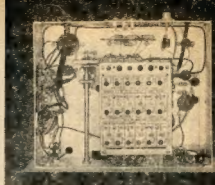
This unit consists of the following parts:—

- (1) Coil unit—type 2619;
- (2) Dial assembly—type 1640;
- (3) Variable gang condenser—type 2791;
- (4) I.F. Transformer—type 701/A;
- (5) Aerial trimmer condenser—type 8475;
- (6) Oscillator trimmer condenser—type 89173.

The coil unit itself is ready wired with valve holders, resistors, condensers, wavechange switching, etc., only requiring external connections for h.t., i.f., gang condenser, i.f. transformer, a.v.c. and aerial. The i.f. is at 4.6 Mc. bringing the unit on to almost any shortwave receiver, and each Amateur band is spread to give the following frequency coverage:—

10 Metres	28.0 to 30.0 Mc.	Band 1
11 "	26.0 to 28.0 "	" 2
15 "	21.0 to 21.5 "	" 3
20 "	14.0 to 14.4 "	" 4
40 "	7.0 to 7.3 "	" 5
80 "	3.5 to 4.0 "	" 6

A trimming adjustment is provided for every coil in the unit and is clearly marked with adjustment frequency figure. The unit can, if desired, be built directly into a receiver using a second mixer to convert to, say, 465 Kc., or may be assembled as a converter, and fed out at 4.6 Mc. to a receiver such as a BC348, BC342, or AR8.



The dial mechanism provides a 72:1 reduction from an epicyclic motion with a nylon cord drive. The cord is spring loaded, giving positive action and preventing a backlash. No cut-and-try method of adjusting the drive cord is necessary as the exact length is supplied, correctly terminated on the loading spring.

The size of the coil unit is approximately 5½" x 4" x 3½" deep and is designed for mounting below a chassis. The dial is 8½" x 5" and the minimum panel height requirement for the assembly is 8½".

THE CIRCUIT

This uses modern type valves—6BA6 (r.f. amplifier), 12AU7 (oscillator and buffer) and 6BE6 (mixer). One interesting feature is the employment of a double triode (12AU7) in the oscillator circuit. The first half is run as the oscillator and the second half as a cathode follower buffer stage. This prevents any pulling of the oscillator frequency by the aerial and mixer circuits.

Fig. 1 shows the complete circuit required to build a compact converter which will impart to an old receiver modern performance, with an excellent signal-to-noise figure of better than 6 db for 1 microvolt input.

The power requirement of the unit is 230 volts at 45 mA. with 150 volts and 6.3 volts a.c. of 1.65 amp. From Fig. 1 it will be seen that the 150 volt stabilised supply may be obtained from an OA2 valve.

A buffer stage (6C4) is included to provide a low impedance cathode follower output and permits a convenient connection to the antenna circuit of the following receiver by means of coaxial cable (maximum length, 80 inches).

An r.f. gain control is provided on the unit, consisting of a variable negative voltage of —1.7 to —20 volts.

An interesting feature of the circuit is the provision of an additional wafer at the rear of the coil unit for adjusting the screen voltage to the 6BA6 r.f. amplifier valve. It will be appreciated that the performance of most valves is better at 3.5 Mc. than at 30 Mc. and this ensures that the sensitivity of the unit is the same on every band, and is invaluable for correctly calibrating an S-meter.

MAKING THE COMPLETE CONVERTER

The design using the Geloso coil unit and dial assembly shown in the photographs was based upon a 18 a.w.g. aluminium chassis 10" x 8" x 3½" deep and front panel of 11" x 9½". The coil



Prototype of the Geloso Receiver Front End Converter Unit.
Controls (left to right): R.F. gain, tuning, band selector, aerial trimmer, R.F. switch.

little background noise. This test was made on a wire antenna and not a beam. Frequency stability was adequate for good s.s.b. reception on 10 and 15 metres. Naturally though, this is dependent on just how well you build this unit in, and how stable is the receiver the converter is fed into.

For the sideband enthusiasts the tuning rate will be of interest. The following figures apply to Australian frequency band allocations: 80 metres, 19 turns; 40 metres, 15½ turns; 20 metres, 26½ turns; 15 metres, 26 turns; 11 metres, 4 turns; and 10 metres, 32 turns.

The general layout of the other components can be seen in the photographs and their exact position can be determined by the user.



ASSEMBLY

First mount and wire all components with the exception of the coil unit, tuning condenser, dial and front panel. The epicyclic drive can now be mounted on a bracket and before screwing the bracket under the chassis slip two turns of drive cord over the drive spindle and locate them around the thin section of the spindle, immediately in front of the brass bush. Mount tuning condenser and dial and secure to top of chassis. Fit in coil unit and antenna trimmer on bracket under chassis. The remainder of the wiring can now be completed. The front panel can be secured in position and the dial mounted. Before fitting the escutcheon to the dial, mount the dial light assembly and push the pointer into position on the tuning condenser spindle. Make sure that the pointer is horizontal and the dial is in the center of the condenser vanes fully in mesh. Check that the dial drum is correctly located on the condenser spindle and that the pointer will turn 180°.

TESTING AND ALIGNMENT

Check all wiring and fit valves. Connect the output of the converter to the aerial input of the receiver and tune to 4.6 Mc. Connect the converter to mains and switch on.

At this stage it would be advisable to check voltage points in the converter. H.t. +230 v., stabilised h.t., screen 6BA6 network, and heaters.

All coil units are checked by the manufacturer before despatch and are usually not very far off. Alignment can best be accomplished by using a signal generator, but this is by no means an absolute necessity if a local transmitter can give a few "spot" frequencies on different bands—or a good station frequency meter is available. In the latter case, an aerial should be connected to

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the aerial socket in place of a signal generator.

Commence by feeding 4.6 Mc. into the converter and peaking the i.f. transformer, then adjust the 4.6 Mc. trap for maximum attenuation. The remainder of the alignment procedure is quite straight forward as all the spot alignment frequencies are clearly marked at their respective trimmers or coil slugs on the underside of the coil unit.

Alignment should be done with the antenna trimmer in the mid position.

A.V.C. CONNECTION

If the user so desires, a.v.c. from their existing receiver may be connected to the converter. This can be accomplished to give maximum results by

retaining manual r.f. gain on the 6BA6 r.f. stage and applying a.v.c. to the 6BE6 mixer.

CONCLUSION

This new receiver front-end will improve the performance of many existing receivers. It combines the advantage of a double conversion circuit with improved signal-to-noise figures and increased sensitivity. The bandwidth will really be appreciated by the operator with that good "surplus" receiver which lacks the bandwidth on Amateur bands. So, with the availability of this unit, we can get performance at least equivalent to, if not better than, many modern communications receivers.

—H. V. Amor, VK3RD.

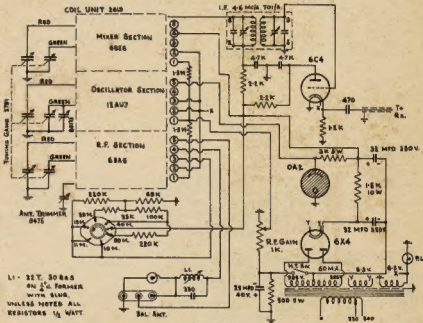


FIG. 1.

The modern practice of leaving the oscillator running during stand-by periods is a suggested amendment to the above circuit.

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The S-9'er Mark II.

THE magazine "CQ" in May 1956 carried an article on the S-9'er, which used a 9-pin miniature i.v. cascode twin-triode, the 6BK7A, to replace and plug into the r.f. stage of any receiver using a 6SK7 or the like. This was a cathode coupled amplifier which gave excellent results noise-wise, with some loss of gain and a few reports of instability.

"CQ" for May 1959, pages 44 and 45, introduced the S-9'er, Mark II, written by K5JKX, which converts the pentode r.f. stage into the cascode twin-triode tube was designed for. Gain in this case was claimed to be equal to the replaced pentode, in fact in some cases better, and the stability was quite good.

I made up both of these models and gave them a solid try-out, and without any doubt the Mark II version more than lived up to the claims made for it. It has been tried in at least a dozen receivers, both commercial and homebrew, and the gain in at least two-thirds of them was increased by 6 db, and the improvement in signal-to-noise was immediately apparent on them all. Some instability was noticed in four of the receivers, but it was immediately cured by earthing the valve can, as suggested in the article.

It will be noted from the circuit that the cathode of the first section is returned directly to ground through pin one of the octal-based socket, thus removing the r.f. stage of the receiver from the normal gain control line and converting the gain control into a purely i.f. gain control, resulting in still more signal-to-noise ratio improvement.

If manual control of the first stage gain is desired, resistor R1 and capacitor C1 can be omitted and a lead run directly from pin three of the noval socket to pin five of the octal base, which will retain the original r.f. cathode circuitry. I personally tried both these connections and felt that the difference, if any, was not worth bothering about, and therefore the saving of two components is worth considering.

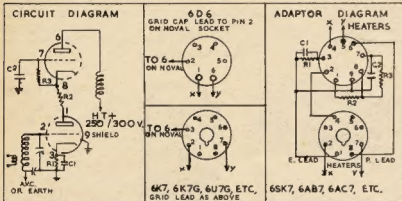
Well, now the pretence is over. This is not a technical article in the true sense, it is simple a re-write of an article in "CQ" which is without doubt a winner and nothing new remains but to give a few helpful hints gleaned from my actual experience with the converter in the thought that it may help to answer any remaining queries that might be in your mind.

Not all twin-triode tubes are worth using in the converter, for example the

In closing, I would like to say that I don't want to talk you into making this converter up if you are satisfied with your present receiver's r.f. stage. If, however, you are looking for an improved signal-to-noise ratio, with no loss in gain, and a chance of some increase in gain, then this is it. The only catch to the whole set-up, as I see it, is whether or not you can get hold of a suitable tube. All of the tubes mentioned are listed in the latest tube manuals, but as they explain, that does not mean they are as yet available.

My thanks to K5JKX for a very interesting article and the opportunity to spend a number of pleasant hours testing the truth of his assertions.

—Warwick W. Parsons, VK8PS.



Base and socket connections are bottom views. When replacing a 6D6, find which heater pin is earthed and connect to pin 9 on noval socket. The same applies to types 6K7G, 6U7G, etc., and for 6K7 metal, if pin 1 is earthed use this instead. Insulate all leads between noval socket and base with spaghetti sleeving.

Component values: R1—100 ohms 1/4w. carbon; R2—33 ohms 1/4w. carbon; R3—470K ohms 1/4w. carbon. C1 and C2—0.001 μ F. disc.

Components of the Mark II. include three resistors, two capacitors, a tube socket, an adaptor base and of course the tube. Any of the cascode designed twin-triodes will work well in the circuit, such as the 6BK7A, 6BQ7A, 6BZ7, and the 6BS8. This latter tube gives the best results mainly because of its freedom from cross-modulation and its extra gain.

With respect to the circuit, whilst measurements will show the difference between a coil-neutralised cascode and one using merely a 33 ohm resistor between stages, no difference can be detected in on-the-air tests and for that reason and also to simplify the adaptor, the resistor was used.

12AT7 or the 6J5, for obvious reasons. The 6BQ7A works OK but is a little down in gain compared to the others; again for obvious reasons. The article stressed the point that in all tests, best results were obtained using 250 to 300 volts on the plate and lower plate voltages reduced the efficiency, and was not recommended.

In one or two commercial receivers which have the S meter circuitry tied up in the screen circuit of the pentode r.f. stage in a balanced network arrangement, naturally the S meter readings go all haywire. In this case, the circuit was used in a preselector set-up with excellent results and is mentioned only as a suggestion.

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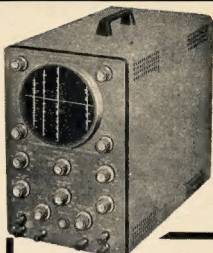
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GENEVA REPORT

SINCE my last report to you I have every reason to believe that the delegations at the Administrative Radio Conference in Geneva have been working very hard in pursuit of satisfactory agreements to all the problems being raised by the various countries—and there are plenty of problems.

As I mentioned previously, a great amount of information from the Conference is of a sub-judice nature and I must ask you—be Australian Amateurs and members of the Wireless Institute of Australia—to believe me when I say that everything possible is being done at Geneva by Amateurs representative of many countries to maintain the Amateur frequency allocations insofar as that is possible against the extreme pressure from the commercial interests.

I can say this quite definitely, that the finalising of frequency allocations is a continuous process in which the entire spectrum is first of all reviewed in Committee Four (the Frequency Allocation Committee) and then sent to various working groups which study small portions, iron out differences and attempt to accommodate as many proposals as possible. From reading the pages of reports sent back to me from John Moyle, it is becoming increasingly evident that the pressures for more frequency space by all services in all countries is becoming greater as the Conference progresses and the full story will not be really known until the Conference is over and our representative returns to report personally to us.

It is quite useless, and most unwise, to make public a running statement on the progress of the various committees and working groups because the same ground is gone over many times and the decisions of any one group are often completely upset and re-opened at a later stage. Often lines of thought develop into discussions of a highly confidential nature in which the most delicate balances and confidences are involved. It is quite evident that the full picture will not be known until the end of the Conference, so it is not possible to forecast the final result or give final information at this stage.

However, initial decisions indicate that Amateurs in Region III, will probably lose 100 kc. off the top end of the 3.5 Mc. band, but the resultant band 3.5 to 3.7 Mc. will be exclusively an Amateur assignment whereas before it was shared with fixed and mobile services.

The 7 Mc. band is being hard pressed by all countries in all Regions for an exclusive Amateur assignment 7 to 7.1 Mc. and it is probably true to say that a footnote will be added that it is an exclusive assignment to the Amateur Service on a world wide basis and that countries will remove existing transmissions from this part of the spectrum. If this is the final result—and this is by no means certain—then we can expect to be in a better position than we were prior to the Conference.

An international telegram from John Moyle a few days ago stated that Australia has agreed to withdraw its proposal to reduce the 14 Mc. band currently used by the Amateur Service on a world wide basis. This is not a surprise because we forecast before the Conference commenced that it would quite possibly never get through the Geneva Conference and this was substantiated by members of the Frequency Allocations Sub-Committee at meetings which I attended with other members of the Federal Executive. As has been said so often during the past many months, the initial proposed frequency curtailments were only proposals and would have to be widely discussed by all countries before we could have lost them. Even now, the present position could change overnight, but it is heartening to know that at least initially Australia has agreed to withdraw its proposal regarding the most important DX band assigned to Amateurs.

Despite the pressure for frequency space in the bands between 3 and 30 Mc., there does not seem any likelihood that changes will be made to the present 21 Mc. band. The 28 Mc. band will also probably remain at 28 to 29.75 Mc. which is officially what Region III. has always had although the Australian Administration has permitted us to use up to 30 Mc. in the past.

As at the last report I received from Geneva, only preliminary discussions had taken place on the bands above 30 Mc. and there is nothing to report at this stage.

Looking at John's reports in retrospect, I am satisfied that the money raised to send our own representative to Geneva has been far from wasted, and the knowledge gained at a Conference of this nature will have been well worth the cost by the time the Conference concludes.

As John Moyle says, and I quote from part of one of his reports, "When extreme pressures are at work, particularly in the bands between 3 and 30 Mc., there isn't much sentiment where national interests are involved, and discussions frequently are converted into major political issues in the big plenary sessions. At the moment of writing there are more than 60 separate committees and groups functioning, and others are created and closed almost every day. The task of following even those in which we are mainly interested is very great, and it has been an education to me which I hope will be completely invaluable in helping us to understand and then handle our problems in the future."

You will recall from my earlier report to you that part of our brief for John Moyle was to investigate more fully the position of the International Amateur Radio Union today and what could be expected of it in the future.

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At a meeting of some 60 Amateurs, he had the opportunity to discuss the I.A.R.U. and reports that he made quite a long speech concerning Region IIP's outlook and what should be expected of the Union during the next eleven years. John reports that he will have quite a lot to say about the I.A.R.U. when he returns.

I hope in the near future to be able to give you a more definite report on the probable outcome of the Conference where our bands are concerned. In the meantime I would ask you to try and appreciate the sub-judice nature of proceedings at this stage and the danger of making public statements until confirmation of the final position is made known.

G. MAXWELL HULL,
Federal President, W.I.A.

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"JUST LIKE 'QST' EXCEPT..."

Some Hints on the Stabilisation of Tetrode and Pentode Amplifiers

EDWARD P. TILTON, W1HDQ

THE four words of our title are encountered almost daily in mail handled by the A.R.R.L. Technical Information Service. They are also voiced frequently by visitors to the A.R.R.L. Lab, who tell us their troubles with equipment they've been building. Often it turns out that instability trouble these fellows have is the result of common misconceptions as to right and wrong methods of bypassing and grounding in tetrode and pentode amplifiers.

We neither expect nor want everything built from "QST" and the Handbook information to be exact duplication of the original. To be of greatest value, equipment descriptions should be used for ideas to be incorporated in gear of your own design. If "QST" and Handbook articles were used only for exact duplication they would not be making the most of the time and money spent on them. The important thing is to know what to change, and what to leave as the original designer made it. Methods employed in bypassing and grounding should be in the latter category.

To some extent each new amplifier represents a design problem. We would not have you believe that every transmitter or converter built in the Headquarters lab, is stable right from the start. But from long experience we have become well acquainted with some of the more common forms of instability. These have all been discussed at one time or another, but a summary may still be in order, especially in view of the fact that assembly details we will be talking about often do not come through well in photographs. Even an experienced builder of Ham gear may find it hard to know just where to put a by-pass lead or a grounding lug, no matter how well the pictorial and descriptive details are set forth in print.

Certain tubes have a reputation of being hard to tame. The 807 was such a dog for many Hams for years, and the evil reputation it built up, largely unjustified, is now inherited (with even less justification) by the 6146. It is true that tetrode and pentode tubes, having very high power sensitivity, may require neutralisation, but more often than not the trickiness involved in getting an amplifier to operate stably is the result of violation, by the designer, of certain cardinal principles. If you yearn for the "good old days" of easily neutralised triode amplifiers it may be that you've been building in some troubles for yourself.

PUT THE SOCKET ABOVE THE CHASSIS!

Many a lab. headache has been relieved like magic by the simple expedient of taking out a socket that was mounted below the chassis and putting

it on the tube side of the chassis or mounting plate. This became really important when we started building transmitters that had to work on many bands without readjustment of neutralization. Cause of the oscillation trouble with sockets mounted under the chassis is often the long plate-cathode return. This return cannot be made effectively via screws going through the chassis. The actual path (and you can often trace it by chassis "hot" spots) is around the edge of the chassis, or through some large hole. Some considerable portion of the chassis thus becomes common to both plate and grid circuits, and the resultant feedback is difficult to neutralise out.

144 Mc. and higher. Then some form of screen tuning becomes necessary. Examples will be found in all recent editions of the Handbook. Such circuits usually involve series-resonating the screen circuit to ground, to provide a path of lowest possible impedance.

Occasionally you will find a circuit in "QST" or the Handbook in which no screen bypass is shown. These bring inquiries as to whether an error was made, and what value bypass should be used. Diagram readers are accustomed to seeing screens bypassed, and they can't imagine it not being done. Sometimes the circuit is a frequency multiplier, and in that case it doesn't make much difference whether the



Models illustrating right and wrong methods for bypassing and grounding terminals of a 9-pin miniature socket. Both show Pins 4 and 9 grounded, with a cathode resistor and associated bypass capacitor connected to Pin 3. In the wrong approach, left a wire is run from Pin 9 through the center shield and Pin 4, to a grounding lug. The bypass is made from Pin 3 to the center shield, making its path to ground common with other circuits. In the example at the right, the pins to be grounded and the ground lug itself are bent lightly against the cylinder and soldered in place. Bypass is grounded at the bottom of the lug.

This sort of thing may not be troublesome in an amplifier designed for a single band, though even here it may make the neutralisation job fussier than it should be. But in an amplifier for several bands the effect of coupling through common ground paths varies with frequency. Your amplifier requires neutralisation on some bands but not on others, or the degree of neutralisation cannot be set up right for several different bands. Having gone through this with more amplifiers than we care to recall, we now put the sockets atop the chassis first, instead of making ourselves an almost certain reworking job by mounting it in the "conventional" manner.

COOLING DOWN THE SCREEN

Once the socket is mounted above the chassis the method of bypassing is still important. The screen and cathode must be at zero r.f. potential or there's going to be trouble. The screen is the villain in some amplifiers that should be stable but aren't. To cool it off, bypass right at the screen terminal or terminals. If there is more than one screen pin, bypass each one separately right to the chassis, with no leads. Forget the old precept of a common ground bus, or a common grounding point. The chassis is the place to go with bypasses, and without any wandering!

Ordinary bypassing may be ineffective in v.h.f. amplifiers, especially for

screen is cold or not. Why waste a capacitor, in that event? At 220 and 420 Mc. several factors come into play that may make screen bypassing unnecessary. The screen-to-ground capacitance within the tube may be enough to do the job at these frequencies. More important, degeneration due to cathode lead inductance, and loading of the tuned circuits by the tube, may cut the power sensitivity of the amplifier to the point where self-oscillation is not the problem it is on lower bands.

THE HOT CATHODE

Oscillation troubles are often built into tetrode or pentode amplifiers by inserting a keying jack in the cathode lead. The cathode has to be cold, too; perhaps even more so than the screen. In the 50 and 144 Mc. excitors in the Handbook you'll notice that the 50 Mc. job has cathode keying; the 144 Mc. one does not. That's because small disk ceramics (probably the best v.h.f. bypasses available at low cost) are effective at 50 but not at 144 Mc. That 144 Mc. cathode (2E28 or 6146) could probably be cooled down by some special circuit tricks, but we found it simpler to resort to some other method of keying, and left the cathode grounded by the shortest possible lead, in the rig for the higher band. Grounding each cathode lead separately may be desirable with the 2E26 and 6146

* Reprinted from "QST," March 1959

BYPASSES THAT DON'T BYPASS

Oscillation troubles are not confined to transmitters, as any v.h.f. converter builder knows. And oscillation is not always where you'd expect to find it—in a pentode or neutralised-triode amplifier stage. We've seen quite a few "grounded-grid" stages that took off all over the place because the grid was not actually grounded. In several instances a wire lead was run from the cylindrical shield in the centre of a miniature socket to a ground lug at one or both sides of the socket. Bypass capacitor leads were connected to the cylinder, or to some point along the wire, rather than to the lug, right at the chassis.

The effect of r.f. voltage building up on a ground lead, perhaps no more than a quarter inch long, can be observed by running the stage in an oscillating condition, and then probing for hot spots with a pencil lead. If the stage is in a receiver, you can listen for scratching sounds. If it is a transmitter, watch the grid current in the offending stage.

least two hassles with sockets of this type in recent lab. experience, but this writer will have no more!

Quite a bit of new manufactured gear employs a device that was all but discarded years ago, the so-called wafer socket. In the days of the "low-loss" insulation craze we looked down our noses at anything but ceramic insulation. Now we know that most other insulating materials are good enough, at least in low-voltage applications, and that the physical construction of the socket as to lead lengths may be more important. The flat wafer socket has a distinct advantage in this respect. If the chassis is a material that will take solder readily, socket terminals to be grounded can be soldered directly to the chassis, resulting in much lower lead inductance than is possible with bulkier ceramic or moulded bakelite sockets.

From all this discussion it can be seen that there are more causes of instability than first meet the eye. With triodes the main cause of oscillation is

TECHNICAL TOPICS

NETTING

HEARD on the 7 Mc. band quite frequently: "This is VK3XYZ standing by for VK5YZK". VK5YZK does not reply. "Another transmitter failure" we think. But no. Re-tuning we find VK5YZK 5 kc. higher in frequency.

Apparently in making contact one of these two stations has failed to net accurately and the result is:—

1. They are occupying two channels instead of one in a crowded band.
2. Their contact may be broken up by a third station coming up on the temporarily vacant channel of the station listening.
3. In replying off-frequency, one station may have inadvertently dropped on an adjacent channel in use by a weaker station.

No good at all.

But why and how do they do it? My guess is that either:

1. They switch on the whole transmitter to net, thus blocking the receiver for 10 kc. either side and tune the v.f.o. until the blocked bandwidth straddles the frequency they wish to net, or
2. They net by tuning the v.f.o. dial to the same frequency read on the receiver dial.

The generally accepted accurate method of netting is to switch on only the oscillator tube of the v.f.o. or such low power stages that the signal can be heard in the receiver without blocking it and zero-beat it with the signal of the station being received. It may happen then that when the final stage comes on, it pulls the oscillator to a new frequency, but if this causes more than a hundred cycles or so change, then an additional isolating stage is required in the v.f.o.

The necessary switching arrangements to bring in the oscillator separately are not difficult to design, but there are a few catches. At the first attempt at my station, switching on the oscillator plate also brought on the screen of a later stage without the plate of that later stage and this does not tend to long life of tubes.

A method of checking whether the oscillator is pulled when the final comes on is as follows: First, listening in the receiver, zero-beat the frequency meter-monor to the oscillator signal. Then switch on the final and listen in on the monitor to see whether it is still zero-beat.

—J.A.G.

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Tube socket with built-in grounding ring and four lugs (left) is an invitation to trouble due to common ground paths. Flange between lugs may not contact chassis, in which case connections made to lugs have long path to ground. Socket at the right necessitates grounding to chassis or to lugs under mounting nuts, making it possible to avoid common ground paths.

In a 50 Mc. transmitter built for the 1959 edition of the A.R.R.L. Handbook we ran into trouble with a 8146 stage that refused to neutralise. We tried several methods; each would come close, but not quite do the job. In this rig we had abandoned the principle discussed earlier and mounted the tube socket below the chassis, primarily to save over-all height. With just one band to worry about, we felt the calculated risk worth taking.

In this amplifier both the screen and cathode leads were hot. Touching the screen or cathode terminals caused a flicker in the small amount of grid current that persisted in the 8146 stage, when drive was removed. In desperation we pulled out the socket and put a different type in its place—and at once the capacity-bridge neutralisation system we'd been wrestling with for days neutralised the stage out as easily as anything we've ever worked with.

The cause of all the trouble was the same old bugaboo, common ground paths, in a somewhat different form. The socket was a popular make having a metal grounding ring in a slightly different plane from the ears that mount the socket to the chassis. There are four lugs extending from the ring that are intended for grounding points. They may be suitable for that purpose at lower frequencies, but in a v.h.f. amplifier the lugs and ring provide a built-in common path for the circuits grounded or bypassed thereto. We've had at

the considerable grid-plate capacitance of the tube or tubes. We neutralise this out with a capacitance that is approximately the same as the tube grid-plate capacitance, feeding back energy 180 degrees out of phase with that fed through the tube, and the job is done. The power sensitivity of triode tubes is low, so the neutralisation process is fairly routine. (We didn't think so back in the '30s, however!)

Tetrodes and pentodes have additional tube elements that keep their grid-plate capacitance at a very low value, usually under 0.1 pF. This in itself is seldom enough to cause trouble, but our layouts usually add other kinds of feedback. If we don't shield or otherwise isolate the input and output circuits there may be fairly large values of coupling between them, by inductive or capacitive means. Power leads, unless carefully decoupled, may provide common coupling. But even a perfectly shielded amplifier with adequate lead filtering can still have common coupling between the input and output circuits through the ineffective bypassing and grounding techniques outlined above.

And when all these factors are taken care of we still have parasitic resonances—but this started out to be a discussion of bypassing and grounding techniques. Squelching parasites is another story, and one that is already covered adequately in the Handbook.

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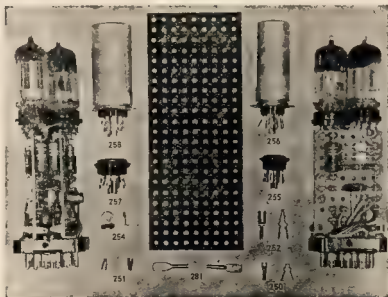
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I.T.U. FUND DONATIONS

Donations to the I.T.U. Fund closed on 31st July, but some more donations are still being received. All donations are welcome as our objective of £2,500 was not quite reached although being very close to it. Federal Executive wish to express their very sincere and grateful thanks to all who contributed in any way. Many subscribed two and three times and indicates the enthusiastic support this appeal received.

Our representative, Mr. John Moyle, is now in Geneva and is at present representing the cause for which this appeal was made—the Australian Amateurs' interests. Although the results of this representation may eventually appear to be obscure on the face of things, our resultant knowledge of the conducting of such Conferences and the contacts made there will be immeasurable.

The great lesson from this appeal is that when the Amateurs of Australia realise an ideal is worth fighting for, they will give their support to the cause. F.E. once again extends its thanks to each contributor and to the many officers in Divisions who gave their time and energies to administer the fund.

The list below acknowledges the contributions received to the 20th September:

£3/11/0 New Zealand Amateur Radio Transmitters Society
£12/4/0 New Coast Zone, N.S.W. Division
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EDITORIAL

(Continued from Page 1)

other hand the Amateurs should expect the co-operation of the t.v. viewer in eliminating interference which, in other than perhaps fringe areas, should be relatively simple if the Amateur transmitter is operating correctly. Therefore public relations is the most vital key to the problem as we see it, and it is up to every Amateur who becomes involved in t.v. cases to remember first and foremost the Amateur's Code.

This won't always be easy for we are experienced, from the early broadcasting days, with the attitude adopted by some members of the public. But we must look always first at their point of view and in a gentlemanly way see what can be done about it.

Currently some t.v. viewers suffering interference from Amateur stations neither approach nor permit the Amateur to carry out the necessary tests to eradicate interference, nor do they approach the Radio Interference Branch of the Postmaster-General's Department. They write directly to their local Member or a Minister himself. The result can be both swift and sure... the Amateur will be told to stay off the air during t.v. hours. It's happened in other countries, so it's nothing new in the Amateur service.

Unfortunately, the Amateur doesn't always know he is causing interference, particularly where the t.v. viewer will not co-operate, and he will be sometimes blamed for interference even when he is not on the air or hasn't been operating during t.v. transmission hours anyway. Of course it's not fair. But that's the problem you are going to come up against. So what to do about it?

First and foremost, remember the Amateur's Code in dealing with the public. Secondly, see for certain that your transmitting equipment is not at fault in any way whatsoever. Thirdly, when co-operation is forthcoming from the t.v. viewer, see that your tests are carried out during test pattern transmission time and not during programme time; this way you will not interfere with other viewers in the same area even if your immediate t.v. viewer is co-operating with you.

In the Divisions of the Institute T.v. Committees will be formed where they don't already exist and they will be asked to forward complete details of all interference problems to the Federal Executive. The Federal Executive will suggest to the Postmaster-General's Department that a committee be formed representing all committee users involved in t.v., manufacturers of t.v. receivers, and other electrical equipment guilty of interference if this is possible.

Remember the Amateur's Code.

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CORRESPONDENCE

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

A.W.I.'s IN VKS

Editor "A.R.," Dear Sir,
I feel I must correct any wrong impression created by Mr. Hardwicke's letter in "Listener Notes." Sept. "A.R." re listeners in VKS. Listeners in VKS may gain the equal of Associate membership of the VKS Division by joining the Short Wave Group of W.A. which is a member club of the W.I.A. (VKS Div.). The annual sub. of \$7/6 includes "A.R." (12/-) and full use of QSL facilities is granted. An Official Number W.I.A.-1 is issued on payment of the sub. which is sufficient to give the listener official status in any contest for which he may enter. The above conditions were agreed to by Mr. Hardwicke (President of the Group) at a meeting with Institute representatives before affiliation took place.

Listeners-members enjoy the same facilities in the W.I.A. as I, a full member, enjoy, except that they have no vote in an ordinary Institute meeting. They do, however, hold meetings as a separate group.

Fees in this Division are: Full members, 35/- per annum, Associates, 20/-; Listeners, 27/6. Will someone please enlighten me as to what way we are falling down on our job of catering for a.w.i.'s in the West? What further "official recognition and privileges" do listeners in VKS enjoy?

—R. ELMS, VK6BE.

P.S.—Incidentally, I am no longer Secretary of this Division, and the above letter should not be regarded as being the official view of VKS Council. I was, however, one of those responsible for drawing up the conditions of affiliation.—R.E.

R.D. CONTEST

Editor "A.R.," Dear Sir,
I think we all, whether listeners or operators, enjoy the R.D. Contest. We have a good old get-together, contact all our mates, or those chaps in other States whom we hear working DX, and in general the Contest in its present form is an event to be looked forward to and entered in the spirit which it is intended. But to suggest, as VK7ZZ has done, that the Contest be divided into two parts, is, in my opinion, most unnecessary. The c.w. section is not patronised to any extent and the average Amateur does not wish to use this form of communication, that is unless conditions make it necessary.

I think, then, you would find that the phone section would be patronised by the present regular contest men and the c.w. section would be virtually eliminated. To me there seems to be no point in altering the present set-up.

It is quite adequate. To bring in a separate c.w. event, which I admit would possibly ensure all participants getting a few more c.w. contacts than at present, would mean setting down to another 24 hours of activity, and this in the middle of winter is something which I for one would not be in as a listener or operator. The whole section would be treated as a separate contest by the chaps concerned, and just take a look at the Field Day entries to see the general attitude to contests other than the main R.D. which appears to be the phone section.

I am strictly a c.w. man myself and when I get on the air later this year will be using that mode of transmission. However, I am not bating to the attitude of many of our members as far as code is concerned. It is not used, not wanted, and considered out-dated by so many of the members that to save all concerned a lot of trouble I say, "Leave the H.D. Alone."

—D. GRANTLEY, WIA-13222.

A NEW SYSTEM

Editor "A.R.," Dear Sir,
I think the constant battle for DX confirmation has gone on long enough; it has always been a wonder to me that there has not been some better scheme put into use. Let me say here, that I am only concerned with proof of a contact and not the collecting of QSL cards. That is a separate subject on which I venture no suggestions.

The confirming of all contacts is both expensive and time consuming. So much so, that I believe it limits the time that can be spent on the air by any rare DX station, unless he has a full-time secretary and a concession with the postal authorities.

It is not necessary to go on giving examples of the inadequacies of our present system as any DX operator undoubtedly knows all the pitfalls.

I believe that the adoption of a system, like I have in mind, would be a great help in clearing up all these problems.

My suggestion is that all stations keep a confirmation log and when a station asks for confirmation, it is entered while the QSO is in progress. Then when the sheet is completed it be sent to the A.R.R.L., or like body, for filing. When application is made for DXCC or similar awards, it would be a simple matter of cross checking. Possibly there could be a certificate issued on request, showing a list of your valid contacts. This could be covered by some small charge. This certificate should be accepted anywhere in the world as proof of a contact.

Well then, I realise there are numerous details in this system that would have to be overcome and many ways that the checking and filing could be done, but I think, once it was given some round-table discussion and got working, it would be a great asset to everyone.

—TOM TALBOT, VK9TH.

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Following interesting items are from Don Gordon, WIA-L3055 —

Card Swappers—Two more overseas listeners anxious to swap cards with other listeners are John Dacourou, Hilemi, Malta; and Oscar Reyes, Caruen, No. 877 Vibora, Habana, Cuba. This card swapping is a very good way of getting to know more about the other fellow, and listening in other countries, but don't try sending your card through the Bureau, as the QSL Managers have enough to do now.

DX. Don't waste a card on ELOK/MM as he won't QSL. ZD6D/F, FB, FC, HI, KM, ZL, NJ and RM are the only Licensed ZD6s. Radio Moscow operates a DX session on the first Sunday of each month at 0500 and 0350 GMT, but no further details available as yet. 43TFJ will QSL 100 per cent. to all s.w.l. reports, provided that they are accurate, and would also appreciate reports comparing his usual to other 487s—there are only four others on the island. His address is F/Sgt. Frank Johnstone, R.A.F. Katunayake, Ceylon. (Txn Monitor.)

Don't be dismayed if cards are lagging from CESAB, he can't answer reports before December, and requests cards to go via the Bureau. Who is the smart guy signing 6RGGT on Nun Island on April 1st. Seems he caught a few of the ISWL boys.

SCIG on 20 a.b., from 1200 to 2300 GMT most evenings and at 2300 GMT on 40, wants reports and will QSL 100 per cent.

ZS6AIA wants reports on 30 Mc, and also is 100 per cent. QSL. **STK** is George Eastland, Box 790, Springs, South Africa.

KSTQO Clave Spencer, P.O. Box 588, Redwood City, Calif. would appreciate a card from any s.w.l. who hears her, she would be OM, KSTQO.

QSL Cards—Frank's remarks re accurate reports draws a chuckle at the very poor reports which are sent out by some s.w.l.s, and many transmitting Amateurs. There seems to be a lot of worthless cards going out from the listeners, according to the remarks heard over the air, and seen in overseas radio magazines. Suggest a perusal of Eric Trebleck's remarks on page 13 of the March 1958 "A.R." which would be in order.

Awards—By the time these notes are read, the VK3 Division will be compiling the information on the new VK SWL Award. At the moment it is still in the talking stage, but several ideas have been put on paper and it is hoped to have something original in the way of an award to offer the world-wide fraternity of s.w.l.s.

National Field Day—I would like to add some words to those in Sept "A.R." but for the benefit of the listeners. In the past, listener sections have been rather poorly patronised, but we have ourselves to blame entirely. In 1958 there were six entries, five having under 30 points. The year before it seemed as though Mac Hilliard was the only entry. If we don't participate, we will find ourselves without an interest in the field day, and in this time of s.w.l. progress it would be a backward step. This is a contest which doesn't require a lot of thinking out beforehand, as does the J.C.

Images in Communication Receivers—Many of us have image trouble in our receivers, particularly those chaps who have a certain brand of set on offer in fair supply at the present moment. Would like to draw your attention to an article in Monitor, July 1958, on the subject. Anyone wanting a copy of this inexpensive wave trap can have it if they care in write to WIA-L3052.

Interstate Contest Challenge—How about you chaps in VK3 challenging us VK3ites in the National Field Day?

NEW SOUTH WALES SWL GROUP

Barry L208 has been doing some DX on the broadcast band. Barry told me the other day that a station in VK3 near 850 Kc. on Saturday night 2355 hours EST has a programme in which they give away a lottery ticket to people living at a distance from the tx. Since they are paying on distances of 50 miles or so, Barry's QSL should win the lot. Good hunting, Barry

Many of our members lent much of their gear for the W.I.A. display at the Chateau-Town Hall. It was held on Monday and Tuesday, 10th and 11th Aug, and was in connection with the Youth Festival Week of the Willoughby Council. Our thanks to all who helped.

Don L2632 reports that there is much good DX on 80 in the early morning. 48 at 0500 GMT is good when one can sift out the commercials.

It is nice to see the formation of a group in VK3. The best of luck to you over the other side of VK. Looks like we have some opposition in the contests. It would be nice to see some of the listeners in VK4 and VK7 form a group and enable us to have an Australian wide s.w.l. set-up. After all, many of tomorrow's Amateurs are today's s.w.l.s.

Still have not recovered from the H.D. Contest. Let's hope there were a few good scores I have had many inquiries about the rules as published in June "A.R." The fact that both calls can be logged, if they are interstate, has not been made clear enough. Many have said that the example log given appears to show that only the call sign that makes the call can be logged. I hope the matter is cleared up in the rules for next year.

AMATEUR STEREOPHONIC TRANSMISSION

During September, Chris VK3AXU, whilst in QSO with VK3AGV, VK3JII and VK2HN, successfully transmitted his voice stereophonically via Amateur Radio. Reports on the experiment showed that whilst Chris moved about the shack, this effect was well reproduced at the receiving station.

Chris is wondering if Gordon, Les, Herb, and himself are the first Amateurs in the world to participate in a stereophonic sound experiment via Amateur Radio.

Chris and Gordon set up their equipment specially for the experiment, whilst Les and Herb listened in. Another achievement for the Victorian S.W. Zone!

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★ GLOBES OF THE WORLD

A large range of Globes for Radio use. American 10" £5/2/6; 12" from £6/3/6; Inflatable Globes, 13½", £4/5/0 each.

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Page 19

ORYX

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**MINIATURE
SOLDERING
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*A must
for
Transistors*

(actual size)

PROTECT YOUR TRANSISTORS WITH ORYX

There is a danger of damage when soldering to transistor leads, due to A.C. leakage currents. The use of a low-voltage transformer supply, with earthed secondary, is therefore recommended. Take care also that too much heat is not applied to flying leads. The ORYX iron, and a heat-sink such as heavy pliers gripping the lead between the contact point and the transistor, will ensure protection.

- Fast heating element, ready for operation in less than one minute.
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Bit Dia.:	Volts	Watts	Nett Weight	Length	Recommended Use
Model 6 1/16" (Fixed)	6	6	0.25 oz.	6"	Electrical measuring instrument fine assemblies, hairsprings, R.F. pick-up and speech coils, hearing aid sub-assemblies, etc.
Model 6a 3/32" (Push-on)	6	6	0.25 oz.	6"	As for Model 6 (for extremely delicate work only).
Model 9 5/32" (Push-on)	6, 12, 24-27½	8.3	0.25 oz.	6"	Hearing Aids, Radio and TV Sub-assemblies, Coils, Electronic Instruments, Model Construction, Electro-Medical, etc.
Model 12 3/16" (Push-on)	6, 12, 24-27½	12	0.5 oz.	6.25"	Radio, Television, and Telecommunications assemblies
Model 18 3/16" (Push-on)	6	18	0.75 oz.	7½"	For heavier work, heat capacity equivalent to that of most 80 watt soldering irons.

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MELBOURNE: Amalgamated Wireless (Australasia) Ltd.

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MSPL58

Amateur Radio, November, 1959

NOTES

FEDERAL V.H.F. CENTURY AWARD

Quite a long time ago the Federal Council of the W.I.A. approved of the introduction of a V.h.f. Century Award. (Certificate) to be issued to those who submitted proof by QSL cards of having made one hundred contacts on the v.h.f. bands.

Because of lack of finance the project has been "shelved" for some considerable time although initially a quantity of high quality certificate blanks were imported from the United States of America and are still in the possession of the Federal Executive.

At one stage members were called upon to submit a suitable design but no efforts were forthcoming. Since it is now proposed to continue with this project designs will be accepted. Anyone who would care to try their hand at designing a suitable certificate now has the chance. A reward of £5 will be paid for the design finally chosen. The lithograph design on the blank certificate is rose-red and a sample of this will be forwarded to anyone seriously interested in working out an appropriate v.h.f. design to be overprinted on the blanks. Please write and request a blank certificate to Mr. Straughair, Federal Executive, W.I.A., Box 251W, G.P.O., Melbourne. In the event of a rush we might have to limit the number of blanks available for design purposes so be early.

When a design is completed it must be returned to Mr. Straughair who will submit it to the Executive. The design forwarded by any person will remain the property of the Institute. If any design not ultimately chosen for the V.h.f. Century Award, a certificate will be issued as a basic idea in part or in whole for any other Institute award, a fee of £5 will be paid to the designer. Please see that your name, club, call letters and address is clearly printed on the back of your design. Multi-color design will be acceptable although it is suggested that one color be chosen when designing, if more than one or two colors are proposed. Don't hesitate—do it now!

I.T.U. GENEVA

Reports from the I.A.R.U. indicate that three of the principal officers of the I.T.U. Conference, elected during the first plenary session in August, are Amateurs.

Charles Acland, VE3AC, is chairman; Jaan Aulial, LU6UL, is a vice-chairman; and Gerald Gross HB9IA, formerly W5GGG, acting secretary-general of I.T.U., is a secretary of the conference.

At a second plenary meeting in August, the I.A.R.U. was one of the 16 international groups admitted to the conference.

John Claessens, G8CL, and Per-Anders Hennan, SM8ED, represented the Union at the opening and for some weeks after, however it is expected that they will be relieved later on by other representatives.

Secretary of the I.A.R.U., assistant manager Hulton are "Industry Members" of the American delegation, and have been assigned to the delegation's allocations group, working in the committee.

Early September the committee had completed preliminary examination of the spectrum below 4,000 Mc. and had commenced an initial exploration of proposals concerning the spectrum from 4 to 275 Mc.

CONTEST CALENDAR

Compiled by W.I.A. Fed. Contest Com.

★
"CQ" WORLD-WIDE:
CW Last week-end Nov. '58.

R.S.G.B. 21/28 Mc. PHONE
CONTEST:

Dates 0700 hrs. Sat., Nov. 21, to 1900 hrs. Sun., Nov. 22, 1958.
Rules: See "A.I.L." October, 1958.

The chairman of committee 4, General Federation, of Denmark, earlier in testing that the various proposals appeared to divide the delegations into two opposing camps—those who wished to leave untouched the present allocation table in the high frequency band, and those who wished to make additional space available for broadcasting, mostly at the expense of the fixed service.

TWO NEW MEMBERS ON FEDERAL EXECUTIVE

The Headquarters Division of the W.I.A. has endorsed the co-option to the Federal Executive of two new members, Mr. David Rankin, VK3QV, and Mr. Tom Straughair, VK3ZIT.

Mr. Rankin was formerly holder of the Limited A.O.C.P. and although his chief interest is in the v.h.f. field, he recently passed his Morse code to gain the full transmitting license. As an experienced v.h.f. amateur he will represent the v.h.f. groups on the Federal Executive and this representation will be the means by which matters raised by v.h.f. licensees all over the Commonwealth will be dealt with. V.h.f. licensees are therefore invited to raise any queries through their Division's Federal Executive and Mr. Rankin will be pleased to present the problems to the Federal Executive and advise of any decisions reached.

The Institute has grown considerably over the past five years or so, and with its growth comes more work. To cope with this and catch up with work which of necessity has had to be left "undone," the Federal Executive is being re-organised so that the work is more equitably distributed. Mr. Rankin will take a little time, but it is envisaged that the results will eventually be well worthwhile. In this re-arrangement Mr. Tom Straughair will be undertaking various outstanding projects and these will be notified to Federal Council and within these columns from time to time.

COMPOSITION OF FEDERAL EXECUTIVE

Federal Executive is composed of the undermentioned members who carry out the various appointments within the Executive:

- | | |
|-------------------------|------------------------|
| President | Man Hull, VK3ES |
| Vice-President | Geoffrey Smith, VK3AG |
| Asst. Sec./Bus. Officer | Bill Mitchell, VK3UM |
| Treasurer | Bob Boase, VK3NT |
| Publicity Officer | Len Burton, VK3AEZ |
| V.P. Secretary | W. J. Deane, VK3QV |
| Project Officer | Tom Straughair, VK3ZIT |
- George Glover also holds the appointment of emergency co-ordinator in addition to that of Vice-President.

CANCELLATION OF PRIVILEGES

In June last, A.R.E.L. received information that the Government of Ethiopia had cancelled all Amateur Radio licenses with the exception of one which is held by a member of the Royal Family.

JAPAN AMATEUR RADIO LEAGUE

This Society now has a membership of some 7,000, and became an incorporated society at its annual general meeting in Tokyo. Kenji Kaji was elected chairman of the Board of Directors.

The meeting was addressed by the President of the Red Cross who praised the work played by JAR in rescue work in disasters and citations were given to those who made outstanding contributions to Amateur activities.

LIBERIAN SERVICE

Liberian Radio Service has granted Maritime Mobile privileges to Amateurs aboard Liberian ships. This concession was obtained by the Union Schweiz Kurzwellen-Amateure.

FEDERAL AWARDS

Credit will now be given for contacts with ZL1ABZ on Kermadec Island. Cross-band contacts will not be considered for credit purposes.

G. Weyland, VK3XU, Manager

NEW SOUTH WALES

The September general meeting of the N.S.W. Division was held at Belconnen Hotel, G.P.O. center S.L. Sydney, on 25th Sept. The meeting

V.H.F. NOTES

At the time of going to press the v.h.f. notes from Frank O'Dwyer, VK3OF, had not arrived.

opened at 8 p.m., the President, Dave KEO, presided. Three guests, visitors to the Division, namely, OH2MT, DL153, and T2 were present. They were presented with a Call Book in commemoration of their visit to our meeting. Applications for membership were received from 21TT, 2APQ and 2WS. Following the usual formalities, 20 new members were admitted to the Division, making a total membership of 1,168.

A letter from the P.M.G. Department was read, regarding the severe interference being experienced each evening at 7.30 p.m. when the 28 Mc. band was used. The Department requested the co-operation of our members in identifying and locating the signal causing the QRM. Reports on this matter will be appreciated.

A report on the Slow Morse Transmissions was made. These transmissions are conducted at 28 Mc. each evening at 7.30 p.m. under the call VK3AWI. We are pleased to have a roster of operators from all over the State to operate this service to our members, and by all reports receiving members are most pleased with the efforts of those taking part. Undoubtedly this will assist many of our Associates and Limited ticket holders to the full call.

The lecture for the evening was delivered in a very workmanlike manner by Bob 2ZAR and dealt with v.h.f. and u.h.f. techniques. The material on his lecture and the apparently new material on the subject of the "bug" in the interest of the gathering and a goodly number of questions were posed at the lecturer. The lecturer, in the course of his lecture, on the motion of 2ZAR, who claimed that the v.h.f. bug had bitten after many years of activity, and we feel that as a result of such a lecture that many will follow his path.

The Convention Minutes were then discussed and all were ratified with the exception of the item dealing with the proposed Convention at Easter 1960, which had been suggested to deal with the report on the Geneva Convention.

The meeting finally closed to allow the usual adjournment for coffee and the ragchew which continued until 11.15 p.m.

We hear that Cried KXQ, of Coff's Harbour, is ill in hospital and we hope that he will be much recovered by the time this issue reaches members. No doubt at a time like this, Cried would be glad to hear from his friends and his friends made over many years of activity. The best to you, old man, from all.

We are sorry to report the loss suffered by Fred 2ZAR, who died of cancer on 24/10/58. Mr. Tretharne will be remembered by many of the older chaps as being an inspiration to all, and we would, by this means, like to express our sincere sympathy to Fred's Division, our deepest sympathy in his great loss.

14th SOUTH WEST ZONE CONVENTION

AT NARRANDERA

The Six Hour Day holiday week-end, Oct. 3-4, was the date of a very enjoyable Convention organized by members and their wives of the Narrandera Radio Club. Registrations exceeded the 100 mark. Readers may not be aware that the Narrandera Radio Club is composed of a number of Radio Amateurs, resident in the town, who are members of this Division.

The function was attended by Amateurs from all parts of the zone, Bob 3ML, Eric 3DY and Peg, and others from Sydney made the trip. The function was held at the Narrandera Convention commenced with a dinner held in the C.W.A. Hall which was attended by the v.h.f. gathering, including wives and children, who were amply catered for. An enjoyable programme followed consisting of an amateur hour and films, including one on the 1956 Olympic Games. Supper was served—the ladies officiating.

Sunday was devoted to a field day and despite the threatening conditions, the programme was run to time. The all time best score was won by Ross 3PN, second prize was a draw between Stewart 3PL and Fred 2AJL. Hidden Tx Hunts were won by Bob 2ZHW and Lind-3PW. Best CW was won by second prize Eddie 1VP, of Canberra, Bob 2ZHW being second. Blind Fold Tx Hunt was won by Neil and the KYL of 2RS won the ladies' section of the hunt.

HUNTER BRANCH

The September monthly meeting well attended and a varied and interesting lecture was given by Frank 2FX, on various Television subjects on the rx side. Stuart 2ZDF was welcomed back after his back after his Melbourne and two new members Ian Fyfe and Doug Dickson were welcomed into the fold as Associates. Frank has promised to continue his lecture at a later date, a statement which was received with enthusiasm.

Amateur Radio, November, 1959

BRISBANE AND DISTRICT

Well, it's good to be back on the job and I'll keep my note book handy to jot down notes. Cheers from 4PR.

Claude 4UX brought along two new associate members from Ayr and mentioned the fact that his classes were on the way with nine hopefuls, and the XVI. Jess, I hope so. Claude will get used to the can opener when the coveted ticket arrives. Frank 4PF spoke of the local class of which 12 attend, including

100

Heard Joe SJO and David SDS in contact one Sunday recently and, boy, oh boy, has that David got a Scotch accent. If John SJW ever contacts him they will never separate them. I was that taken up with the accent that I could not switch off. I wish that I had one like it, I would get me a job on this new fangled idea t.v. and I bet I would get all the

Erg 5KU is still keen on 14 Mc. and his c.w. signals can be heard calling the DX at all odd times. John 5JA is keener on the one-eyed monster than on Amateur Radio at the moment, but as he is interested from a business angle we can possibly pardon this lapse from grace. Let's hope it won't last too long. Leo 5JG is chasing the DX on 14 Mc. and is fast

assuming the mantle of Stuart SM5 with regard to DX. SM5 has switched his allegiance from 14 to 3 Mc. and can be heard calling the rare ones at odd times. Have a list for my signal Stuart, quite a number of the local pressants thinking me that my signal is exceptionally rare!

Col 5CJ has a casual contact on 40 now and again, but is by no means as active as he used to be. He is going along to the meeting the last time he was down here and renewed his acquaintance with the gang. Tom 5TW Sobe up on 3 Mc. most of the time but is not as active as that has slowed down a little on the air. He was going at top speed, however, when heard here in the R.D. Contest. How did you go Tom? Don 5ZLJ along to the contest? I went up steam to come on the air at the moment of writing, but if he doesn't hurry up we will have to alter our call. Oh, he is as witty when I like. The South East gang appear to be pretty keen, if the attendance at their monthly meetings can be taken as a guide. A recent meeting took the form of an inspection of the new Mount Gambier autotelephone exchange, and under the guidance of 5JG the inspection was appreciated by all. No one was West of the coast this month. Heard Wally 5DF on the 8W1 call-back last Sunday, but as he simply said, "Hello" and then went on to say he was going to try 1V Ken 5AL heard on 7 Mc. this month with a good signal. He has not been on the air for some time, probably not since he left the North. Heard him on 3.5 Mc. occasionally on 3.5 Mc. He is now living in one of the Adelaide suburbs and should be heard consistently there. Heard John 5CKX, the chairman of the VK3 W.I.C.E.N., has been heard on 40 and 80 at odd times over the month, but any other activity on the air remains to be seen.

John 5JC, assisted by his XYL Betty, is the father of a bonny bounding daughter this month, and all are doing grand. Some doubt existed as to whether or not John would recover, but as the medico said in an interview this week, "He had never lost a father, and what John and Betty had was anxiety at the time, he was never really worried!" We Amateurs are made of stern stuff.

Earlier I made mention that Tom 5AQ was still overacting. He is, but in a good way. He made lightning dash by sea, land and air, and bobbed up on 40 at the call-back by 8W1 after the session. I have made the necessary alterations to the staff, and the one that worries me is that my palmy-waiy the editor will possibly get the idea that this explanation is only another dodge to get more space in the paper. I think I know him better than that!

There are old-timers and real old-timers in Amateur Radio, and I remember an old-timer this month in the person of Lance Jones (5BQ). He was one of the original half a dozen or so pioneers in VK3 of our grand old hobby, and incidentally one of the Builders of the First and Best Broadcasting Station in VK, none other than 8DN, which I have a honour of being on the pay-sheet. Starting as an Amateur Station it has grown to be the power that it is in VK3 because of the enthusiasm of its technical staff. All Radio Amateurs are indebted to him, and although he has possibly been of some assistance, ahem! Lance is looking fit and well and wishes to be remembered to all who may remember him, although not active and naturally lost his call sign, he still leans toward Amateur Radio as a hobby.

5BQ 5DF is heard occasionally on 40 at my location, but is apparently busy grinding grain. His brother is busy grinding his brains in an attempt to get the ticket at the distant exam, and as this being rare probably now knows whether it was worth while or not. Best of luck OH.

5BQ 5DF has been called the "City of Culture," it has sometimes been called the "City of Churches," and once it was called by a disgruntled VK3 sub-editor named Phil, to the "City of Pubs." We have the simplest code of ethics and standards of behaviour, and it sometimes seems strange to those who come from other countries, accepted standards. Bearing this in mind, imagine my horror and disgust the other night when I heard with my own ears a certain VK3 announce to all that he was going to he had allowed some s.w.'s to take away a pile of chams and junk, thus saving him the trouble and expense of sending the parcel to be called. Now how low can one get, the jeering chuckle that ended his confession so unnerved me that I have not yet brought back a letter for him. I have a call book in order to unmask him to the world. I think that I am strong enough to check up now to see how he reacts. I turn the pages, VK3R—VK3RN—R. W. Hignbottom

OBITUARY

ATROL W. JOHNSON, VK7AJ

It is with the deepest regret that we record the passing of Athol W. Johnson, VK7AJ, on September 4, 1959, after a long illness.

Athol, who was one of Tasmanian's most progressive and versatile men, was born in September 1917 and quickly gained recognition by his outstanding skill and technical knowledge. He was keenly interested in v.h.f. work and was one of the few Tasmanian Amateurs who worked consistently on 2 and 6 mc. His car, which was originally equipped to work mobile on 48 mc. was re-fitted with 1 mc. gear complete with a halo antenna and the many contacts he had with this equipment gave him much satisfaction. His main station comprised an all-band ix and rx which worked in conjunction with rotary beams on 20, 10, 6 and 2 mc. a ground plane on 20 mc, a nepp type and a long wire which extended for approx. 1,000 ft. across the valley close to his home in Kemilly St., South Hobart.

He was an exceptionally versatile man with many varied interests. He was a highly skilled craftsman and his exceptionally well equipped workshop contained many machines and test equipment of his own design and construction.

Although confined to his bed for much of his time in recent years, he managed to keep in close touch with Amateur Radio via the "wire." His interest was not only in his own work, but he was also active outside the Amateur bands brought his reward when he was instrumental on Jan. 8, 1955, in bringing about the rescue of the "Lexa" and her crew.

He was an enthusiastic member of the Tasmanian Division of the Wireless Institute of Australia and took an active part in all its activities. He was a member of the Council for four years and was also v.h.f. officer and Federal Councillor. He gave many courses in v.h.f. work and all were characterized by a thoroughness of preparation and were given in a clear and concise manner. The many practical tips given in a small number of his own experience were an outstanding feature.

As a man, Athol possessed a most likeable disposition with an infectious cheery sense of humour. He was a man to whom those who turned to him for assistance with their technical problems. One of his most outstanding qualities was the courageous fight which he put up during his long illness. His fortitude in this regard was one of those rare and wonderful examples of a dogged determination. In the face of a relentless malady, his valiant persistence was a severe blow to all who knew him. To his widow and daughter we extend our heartfelt sympathy in their sad bereavement.

R. W. Hignbottom, W. HIG-BLIME! Oh well, I suppose that there is always two sides in every question, and I don't think that any dustman should be given a bad press, and standards can be stressed too much, and after all, Editors must have some privileges not granted to us lesser mortals. Personally, I think that a "wonderful" thought, as the s.w.'s a gift and probably saved the dustman some hard work, and without doubt such a fine gesture. I am sure that the publisher like this 3RN would only do the right thing as a natural reaction. PHEW!

TASMANIA

We extend our best wishes to Alex 5AX, Chairman of the Federal Contest Committee, who has been on the sick list for some time now; a speedy recovery, Alex. The contest Committee, under the leadership of Alex, has been very busy engaged in checking Remembrance Day logs, since about the middle of September. The contest is now in progress. Contest should soon be over, and our thanks are due to them for their considerable efforts on behalf of Amateurs generally. Incidentally, this is the first time that the contest has been held on the return of 67 contest logs out of the 68 stations which took part. Never before has the return of lost logs been so high a proportion of the number of stations taking part.

At the time of writing, the phone section of the VK-ZL Contest is over, and I would say that conditions were as bad as they have ever been during a contest. Most of the 24 hours passed without the semblance of a DX signal. For only about two hours were signals audible and then only with considerable QSB and QRN.

Mobile VKS is now v.f.n. controlled and has a moderator in service. Snowy TCN and yours truly must now be about the only c.w. men working now. Jim 7ZL will work Bob 7CK 7X, and Hobart, so our gain will certainly be Devonport's loss. Welcome to the big smoke, Jim.

Bob 7OM has been resident in ZL for most of September and the first half of October. We will miss his work. Bob 7CK 7X is again active on all bands, since the removal of the power noise about the end of September. Keith 7RX has a 120 ft. mast in operation and would appreciate any reports on its operation, particularly from a distance.

Stereo is now all the rage with the record connoisseur. Well, 5Xyes 7TF will be able to show you how cabinets to house such fine equipment should be made, good work Wiles. The time and weather for trying out your stereo system is now. 5Xyes 7TF and W.I.C.E.N. net hopes to have such an exercise either in November or December, so get your portable rigs ready chaps.

NORTH WESTERN ZONE

Time marches on. The most important item of interest to report this month is that about half a dozen of our associate members had a shot for the A.O.C.P., and I feel sure that everyone will wish them the best of luck. More QRM I suppose in the not too distant future. More participants for the S.D. Contest next year.

Our October meeting was held on the 6th and I regret to say was poorly attended indeed. With excm. Over for associates we took forward to a much better attendance next month. We hope an eventual meeting in the month of March. The W.I.C.E.N. was somewhat made the number up to thirteen. The meeting's business was disposed of, interspersed with several interesting and enlightening discussions which I think froned out several matters whilst others were left in abeyance pending further natural development. Some quite valuable pieces of equipment were disposed of by auction.

I do believe we are losing Jim 7ZO to the Southern end of the island. Miles 7MF sneaked down South from up this way a short while back and Peter 7PF betook himself off to the Launceston area. I sincerely hope no more of our members decide to leave us for a while, at least, not until we have patched up our ranks once more.

Frank 7FH has got himself a really big power transformer and is at present working on means by which he can get himself some really high-tension from it with the minimum output in db. Yours truly still hasn't done any more to the rig, still deriving great enjoyment having quiet QSOs with 10 watts.

The zone net each Tuesday and the W.I.C.E.N. net are still functioning OK with the regular attendance. A few new members have joined in, especially on the Tuesday night rally. It won't be long now before we start to hear again, I hope, from the "d.g." for a while if you sorted out the d.g. gear once more.

HEADS

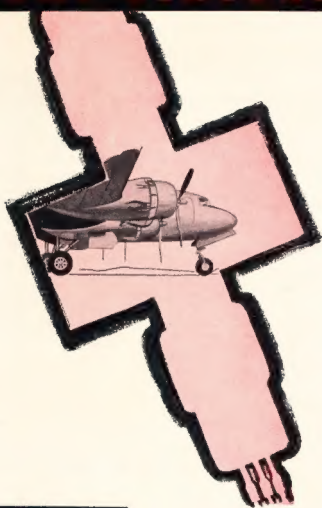
1/- per line, minimum 3/-.

Advertisements under this heading will only be taken from notices from radio amateurs. The disposal of equipment which is their own personal property. Copy must be received by 8th of the month, and remittance must accompany advertisement. Advertisement will be run on an average of six words a line. Dealers' advertisements not accepted in this column.

FOR SALE: M292C Compass Revs.

a.c. pwr. aply. £29. BC453 Q5er, £5. Command Trans., £4. Power Transf., 750v. aside, 250 ma., £5. Choke, 10H., 300 ma., £11. APN4 Iron Indicator with 100 c.c. scale, £10. Amateur Revs. Revs. 12 tube cable, cone £10. Ibbot pick-up, 3 heads, diamond 1L stylus, as new, £5. Valves: 832 21, 829B 23, 807, etc. Pair selyns £2, meters, etc. D. Dunn, 3 Monamore St., Alphonington, Vic. Phone: JW 1253.

DME BEACONS



DME (Distance Measuring Equipment) is an Australian triumph in the field of civil aviation. Developed by AWA, and operated by the Department of Civil Aviation, it consists of ground beacon transmitters which emit coded pulses of rf power when interrogated by a signal from an aircraft. In the aircraft, measurement of the elapsed time between interrogation and reply is translated into a reading on a dial of the aircraft's precise distance from the beacon in question.

DME beacons are installed all over Australia, and contribute greatly to our high standard of airline navigation.

The pulses of rf power emitted by DME ground beacons are provided by the 5786 power triode, manufactured in our factory at Rydalmere, N.S.W. The 5786 is forced air cooled, and can continuously provide a kilowatt of rf power at one hundred and sixty megacycles. *It is worthy of consideration for dielectric heating equipment at high frequencies.*



**AMALGAMATED
WIRELESS
VALVE COMPANY
PTY. LTD.**

47 YORK ST., SYDNEY





GELOSO AMATEUR BAND FRONT END RECEIVER CONVERTER UNIT **ML209/FE**

(As used in the Geloso G209/R Receiver)

Geloso offers a complete front end kit from the R.F. stage to the I.F. input at a very attractive price.

The **ML209/FE** Front End Converter Unit comprises the following essential parts:—

Cat. 2619	Amateur Band Coil Unit
Cat. 1649	Calibrated Dial Assembly complete
Cat. 2791	Variable Gang Condenser
Cat. 701/A	I.F. Output Transformer (4.6 Mc.)
Cat. 8475	Trimmer Condenser (Aerial)
Cat. 80173	Trimmer Condenser (Calibration)

This Kit provides outstanding technical attractions: -

1. Band coverages: 10, 11, 15, 20, 40 and 80 metres.
2. Ample bandspread on all bands.
3. 4.6 Mc. I.F. output.
4. Tube line-up:—

6BA6	R.F.
12AU7	Oscillator
6BE6	Mixer
6C4	Cathode Follower Output Tube.
5. Trimmer condenser for aerial circuit.
6. Oscillator trimmer condenser for use with a built-in 3.5 Mc. crystal marker.
7. Complete assembly instructions included with each kit.



AMATEUR NETT PRICE (less tubes) £24/10/0 plus sales tax 25%

* * *

ML209/FE will shortly be available as a foundation kit including panel, chassis, cabinet, etc., and will also be obtainable fully wired and checked.

* * *

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